

Wildlife conservation in Australia: State of the Nation

(Keynote address to ACIUCN *Threatened Species Conference*, 1-4 December, 1989, Taronga Zoo, Sydney.)

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INTRODUCTION

How many people fully appreciate the environmental problems which Australia faces as it enters the final decade of the century? As put by an increasingly large number of the world's ecologists, ten years is the time remaining for the world to avert global ecological catastrophe. If Australians fully appreciated the seriousness of the planet's environmental problems and could understand that Australia was part of a global ecosystem, we would hear less about saving individual species or reserving small parcels of land as national parks and more about habitat conservation and ecosystem management on a national and global scale. There is the risk that emphasizing the conservation of individual species diverts attention and resources (time, money, and people) from understanding and correcting the causes of species decline and extinction. This can leave species that are common to become scarce, then rare, and finally to become extinct. It is a view I have argued in various forms for nearly 20 years (Recher 1971, 1976, 1985; Recher and Rohan-Jones 1981).

Although habitat conservation is a basic objective of any national park or nature reserve system, it is only now that we have begun to address the problems of conserving species through the management of entire communities (e.g., New 1987). I fear that for many species and for much of the continent it is too late and that we will be defeated by the magnitude of the problems confronting Australia and the inherent inertia of government and public alike to accept change in traditional values.

In this paper I review the status of wildlife conservation in Australia and consider the options available to us for the restoration of degraded landscapes and the prevention of the further extinction of species.

The Status of Australia's Wildlife

Often when people refer to wildlife, they mean only native animals. I prefer a broader definition; to me, wildlife is all species of plants and animals including introduced species. Many of us may be familiar with the major wildlife conservation issues in Australia, but a brief review of the impact of European settlement on the continent's plants and animals is useful in drawing attention to more subtle problems and for justifying the need for changes in social attitudes towards wildlife and the environment.

In a review of the status of Australia's terrestrial vertebrates, Recher and Lim (1990) concluded that no continent has been more severely affected by Europeans, in a shorter period of time, than Australia. In support of their conclusion, Recher and Lim (1990) made five observations which are worth emphasizing, as they may not be as widely appreciated or understood as they should be. A sixth point, of equal significance, is added here. The six points are:

1. Taking all categories of concern (e.g., rare, threatened, endangered) as equal, nearly 20% of the continent's 1 700 species of vertebrates are at risk of extinction (Recher and Lim 1990). It is sobering and, perhaps indicative, that 33 of 44 species of native freshwater fish in Victoria are extinct or threatened (Commissioner For The Environment 1988). Nothing that I have seen suggests to me that the situation is any different for plants or invertebrates. Of more than 22 000 species of native plants, 100 species are thought to be extinct and more than 2 000 others are threatened with extinction (Briggs and Leigh 1988; Fry and Benson 1986). Estimates of the number of species of Australian invertebrates range from 100 000 to over 300 000 species. Most are undescribed by science and their status is unknown (Fry and Robinson 1986; New 1987), but there is no reason to believe that the effects of European settlement on invertebrates has been less than that on vertebrates. Obviously no endangered species programme can address a problem of this magnitude on a species by species basis.
2. These lists are incomplete. For example, despite the fact that the Regent Honeyeater *Xanthomyza phrygia* has declined in abundance for the past 30 years and is now threatened with extinction, it only appeared on a list of endangered fauna in 1986 (Burton *et al.* 1986). The lists reflect the inadequate data available for most of the continent's wildlife. This will not improve given government policies towards the CSIRO, the universities, research and education where funding is inadequate to maintain programmes (e.g., West 1989) and has led to some of the nation's most productive scientists being laid off on the grounds that their studies of insect systematics was not a national priority (Blackburn 1989a). Indeed as awareness of environmental problems increases, the capacity of the nation to respond with scientifically based plans of management decreases.

3. Almost all the adverse impact of Europeans on Australia's wildlife can be explained by low and irregular primary productivity resulting from the prevalence of low nutrient soils and limited rainfall over most of the continent, and by the extensive clearing, fragmentation and alteration of virtually all (70 to 95%) native vegetation (Fry and Benson 1986). An estimated 2 000 species of exotic plants are naturalized (Briggs and Leigh 1988), and significantly change the character of the plant communities they have invaded. I do not subscribe to the view that most of the continent remains under "natural vegetation".

Introduced herbivores are also a cause of the degradation of native vegetation, while the impact of predators such as the European Fox *Vulpes vulpes* on native animals is largely a consequence of the fragmentation and alteration of habitats through clearing, changed fire regimes, mis-use of chemicals, and over-grazing by introduced herbivores.

The impact of introduced and native predators on endangered fauna is intensified by the large populations which can be sustained by feeding on rabbits *Oryctolagus cuniculus* coupled with the fragmentation of populations and the reduced abundance of native animals.

4. Degradation of soil ecosystems across the continent threatens not only the long-term prosperity of the nation and its capacity to feed itself, but is the single most important fact endangering wildlife communities. Without soil, none of us can survive. Under current agricultural practices soil is a non-renewable resource that is being mined at a rate which makes agriculture (not forestry) the nation's most important resource management issue (e.g., Hawke 1989). Fifty per cent of Australia's soils are severely affected by erosion, salination, or the breakdown of soil structure (Anon. 1986). In western New South Wales, 90% of soils are affected to a measurable degree (Anon. 1986).
5. The fifth point is the rate at which change occurs. The span of time from settlement of a region to the deradation of its ecosystems and the loss of wildlife is not measured in hundreds of years; we are not describing or discussing the consequences of 200 years of European colonization on the Australian environment. As Recher and Lim (1990) emphasize, the loss of biotic diversity and the degradation of landscapes is measured in decades. With modern technology the time from when a district is first settled — opened up to agriculture — to when its wildlife disappears is closer to 20 or 30 years than to 80 or 90 years.

As in the wheatbelt of Western Australia, species may disappear precipitously (Saunders and Ingram 1987; Saunders 1989). So rapid is extinction that few people notice the loss. Early in the 1970s some residents of Lord Howe Island confused their childhood memories of the Lord Howe Island Woodhen (*Tricholimnas sylvestris*) with the current abundance of the bird and thought it common (Recher, unpubl. obs.), when in fact there were fewer than 25 individuals and these were confined to the summit of Mt Gower (Recher 1974).

What we can describe, and what is continuing to occur, is the rolling impact (a wave) of settlement as development has proceeded from east to west, and from south to north. The pattern of change seen in the last century in southeastern Australia is now being acted out in the south-west and north of the continent.

Without immediate and direct action, the final episode will be the precipitous extinction of much of the continent's biota.

Rates of change/degradation are slower where the soils are richer and there is reliable rainfall. However, the fragmentation of forests and woodlands through continued clearing and ever more intensive forestry practices (woodchipping or integrated logging, plantations of native and exotic trees) coupled with the adoption of fuel reduction burns (prescription fires) on short rotations (3 to 7 years) is accelerating the destruction of the continent's richest and most diverse ecosystems. It is ironic that some of these actions are promoted as conserving forest wildlife and are supported by conservation groups. It is common to hear arguments that plantations will relieve the pressures placed on native forests for timber, but such arguments fail to recognize the clearing of forests that takes place for plantation establishment, or that even plantations of native trees can sustain only a small portion of the wildlife found in natural forest. Where, as in Western Australia, eucalypt plantations are based on species exotic to the region there is the risk of degrading the remaining native forests through the invasion of new tree species even if these are also eucalypts.

The emphasis that the conservation movement has placed on rainforest conservation is difficult to refute. Rainforests are important ecosystems that should be protected against development. However, there needs to be equal attention paid to the more extensive eucalypt and acacia woodlands of the drier pastoral zones where hundreds of thousands of hectares are being cleared annually with the loss of all wildlife

(Nadolny ms). We need to recognize that the richest ecosystems in Australia are its eucalypt forests and woodlands and not its rainforests.

6. If we can accept land degradation as the single most important challenge facing the nation (Hawke 1989), and posing the greatest risk to the continent's wildlife, then the second most significant issue is the degradation of our aquatic environments — freshwater, estuarine and marine ecosystems. Water degradation is the great unseen, unspoken and unrecognized threat to our survival and to the conservation of Australia's wildlife. If the degradation of the land endangers our capacity to sustain life, then the degradation of our waters threatens our capacity to feed ourselves from the sea — and it endangers all freshwater and marine organisms.

It is because we cannot see under the water that the issue is hidden. It is because mangroves and fish do not evoke the same emotional response as tall trees and mammals that we fail to address the need to conserve and manage aquatic wildlife. For example, I cannot think of a terrestrial environment in which there are no reserves specifically for the conservation of wildlife, or where commercial and recreation harvesting of wildlife is considered suitable reserve management, and where the management authorities persist in stocking or introducing new, ever more efficient predators on native wildlife. Yet this is the situation which dominates the conservation and management of Australia's aquatic environments. There are few, if any, objections to the continued stocking of creeks and rivers (even in national parks) with trout. The closest analogies are the exotic eucalypt and softwood programmes of the forestry services and the grazing of honeybees *Apis mellifera* for commercial purposes in parks and reserves.

Such actions reveal an incredible ignorance of ecological processes and a disdain for natural landscapes that pervades even the most "professional resource management institutions". It is an indictment of our schools and universities and their capacity to instill a sense of humanity in students. Leopold's (1949) "land ethic" remains a dream.

Status Report

The state of wildlife conservation in Australia is poor and getting worse. We face the massive and accelerating extinction of species. Recher and Lim (1989) predicted the extinction of ground-foraging and ground-dwelling birds throughout Australia — up to 100 species or a fifth of the terrestrial avifauna — over the next 30 years as a

direct consequence of the degradation of soil and litter ecosystems. Degradation which is the direct result of agricultural and forestry practices.

The action being taken to prevent this from occurring is too little. It comes very late — perhaps not too late, but there do not appear to be any long-term commitment on the part of local, state or national governments to soil, water, or wildlife conservation programmes. I do not see leadership from government and I am skeptical about the commitment of the main political parties, unions or industry groups to resolving environmental problems — much less preventing a new generation of ecological disasters.

Most governments in Australia have abundant and useful environmental legislation which could be used to achieve many of the objectives of wildlife conservation and environmental management. The pattern throughout Australia is to avoid using this legislation on the argument that it impedes growth and development, and costs jobs. In forestry, agriculture, pollution control, water resources and fisheries there appears to be an unhealthy and close relationship between those who seek to use the resources and those whose job it is to manage those resources for the good of the community. If there is no commitment to environmental management now, the prospects that new legislation will be acted upon appears uncertain at best and unlikely at worst.

The Prime Minister's "OUR COUNTRY, OUR FUTURE" (Hawke 1989), while welcome, failed to address the hard issues of energy and population, to mention just two. Senator Richardson's strategy document for threatened species conservation (ANPWS 1989) is also welcome (and well presented), but lacks a clear timetable for change, provides no commitment to funding, and does not address the issue of who will do the research. In a climate of sacking scientists for lack of immediate relevance to commercial priorities (Blackburn 1989a,b) this is a particularly relevant question.

The prognosis for wildlife conservation and endangered species management is poor. I am disinclined to say that the nation has terminal cancer, but there is a need for innovation and major therapy. THE PROBLEM IS TIME. I used an analogy at the Geraldton conference of Martin Luther King's famous words "I have a dream". King dreamed of a changed America, an America where all races had equal opportunities and were afforded the same rights. If we dream of conserving Australia's biota, of maintaining genetic diversity, of preventing any species from going to extinction, we do not have time to waste. A decade, or even half a century, is not much time in which to act.

The Challenge

Two points emerge from the above:

1. The rate and scale of change have exceeded our capacity to adapt, or even to recognize the change, much less to respond in anticipation of change.
2. Effects are not seen by governments until it is too late with the result that conservation is synonymous with crisis management.

Whatever action is taken to protect endangered species (or for that matter wildlife in its broadest sense) will need to overcome the problems created by the extreme rate at which change is occurring. For example, the increase in Australia's population in the past two decades is greater than the total population at Federation and will increase by that much again in the 20 years that soil conservationists say is required to reverse the trend of increasing land degradation (Burton, pers. comm.). It will also be necessary to convince people that urgent action is required. It is an unfortunate fact of human behaviour that problems which cannot be seen or which have no instant or direct effect on the individual (e.g., sheet erosion, extinction of inconspicuous species, toxic chemicals in food and water, thinning of the ozone layer) do not exist; they are not important.

The action needed is far greater than endangered species legislation or species action plans can provide for.

There is a need for a review of Australia's national goals and the redefinition or measurement of progress and quality of life in terms of clean air, clean water, chemical-free food, and the sustainable use of resources (land, water, forests, wildlife, minerals). Along with the fundamental freedoms of speech, right of assembly, and diversity of opportunity and choice, these are inalienable human rights.

Such a fundamental change in Australian life guaranteeing these rights to all people and to all generations requires changes in national and state policies based on a growth economy and the assumption of an expanding population. It means a change from economic growth measured in terms of consumption and dollars, to one measured by negative population growth and reduced consumption. It will not be easy to convince people that each Australian consumes resources equal to that used by 100 Bengalis or 60 Indonesians and that we have the same special obligation of all developed countries to reduce our consumption of resources so that more is available to others and that our individual impact on the environment is sustainable (e.g., non-polluting).

Australia's effective population is not 18 million, but is more like 1.5 billion in terms of their impact on the world's environment (see papers in Clark and Munn 1986). It may not be easy to convince people of the need for change, but it will be necessary.

Redefinition of national goals does not mean breaking out the candles and locating the nearest cave. Nonetheless that is how it is presented by the commercial interests of the country who seek to lock up resources for their own use and to deny them to future generations (for an alternative view see Keegan 1989). It is the mining companies, the timber lobby, the fishing industry, the farmers and the coastal developers who lock up and squander the nation's wealth and resources, not those who seek to guide the use of these resources on a sustainable level. Those who promote sustainable development with a balance between development and environmental protection seek to maintain the basic human freedoms of the right of access, of a clean environment, and of a diversity of choice. Reserving the remnants of Australia's natural landscape as national parks or nature reserves does not lock up resources, but frees them for all people and all generations to experience and enjoy.

Redirecting national priorities will require fundamental changes in our attitudes towards the land and towards common resources, such as air, water and fisheries. Individuals should not be free to use their land in whatever way they see fit — individual land use practices need to conform to the need for sustainable production. Common resources can no longer be taken on a first come, first served basis — no one has the right to pollute or to over-harvest.

No person owns these resources and no government should alienate these resources by selling or giving them to individuals. It is a corruption of responsibility to sell the birthright of a nation to any individual or group. Yet this has been, and continues to be, the policy of governments throughout Australia.

Management and Conservation of Endangered Species

The management and conservation of endangered species, species assemblages, communities of organisms or ecosystems also requires new directions. These include;

1. **Conservation by reservation is a limited option.** Existing reserves are atypical, fail to sample most of the continent's biota, most are too small, and have ecologically unsound boundaries (Recher 1976; Lunney and Recher 1986; Hall 1988). As a result, species extinctions are common (e.g., Saunders 1989).

Wildlife management and conservation, if it is to succeed, must be extended to all land, regardless of tenure, and despite arbitrary political boundaries or bureaucratic divisions. Government departments must work together in recognition of their primary responsibility to the community and not to some perceived hierarchy of power within government or to an imagined obligation to industry.

The concept of multiple-use parks — which imposes environmental guidelines and wildlife conservation/management on land already committed to other uses — merits consideration.

This does not mean that existing national parks would be opened to mining, to logging or to tourist development or that there is no need to reserve more lands as national parks or nature reserves. To the contrary, the reservation of additional parks and reserves is an immediate requirement given the magnitude of wildlife conservation problems facing Australia and the difficulty of achieving sound land management practices across different land tenures. In New South Wales, for example, there is an urgent need to protect the national estate areas in the south-east forests, to preserve all remaining old growth forests, to reserve remaining coastal lands from development, to establish a system of reserves in the Western Division which samples the full range of biotic diversity in that part of the state, and to protect all remnants of native vegetation in the Central Division. In the longer term, and in a healthier environment, mining or logging within a park could be approached with more flexibility and evaluated in the context of improvements elsewhere.

2. Conservation by legislation will need more thought and less emotion. Victoria's Fauna and Flora Guarantee Act appears idealistic and, in the long-term, a literal interpretation of its biological meaning may prove difficult to enforce. Legislation which cannot be enforced, or implemented, is worse than useless. It is negative and diverts attention and resources from possible achievements. Despite my concerns, Victoria's legislation sets standards and goals that all Australian States could emulate.

Any legislation which is adopted must emphasize habitat or ecosystem conservation as much as guaranteeing the survival of species. As in the Victorian Act, processes which affect or potentially affect species and ecosystems must also be regulated, controlled and managed. All such legislation must apply equally to the Crown, industry and individuals. For this to work, changes in the judicial system to accommodate environmental litigation are required.

Only New South Wales has a court specifically established to hear environmental cases. Even this court can be constrained and legal action evaded through the powers of Ministerial discretion or by Parliament passing legislation exempting particular developments from the provisions of the relevant Acts. The more successful the Court is in resolving environmental debates, the more frequently government has sought to avoid it through Ministerial exemptions or by appointing a board of enquiry.

3. Research and education are common themes in the background papers to this conference and among conservation groups. It would be nice if the "environment" was elevated in national curricula to the same level as English, maths and science. A knowledge of environmental processes and the role of humans in the world ecosystem has more survival value than a knowledge of Arabic or even of Japanese.

The conservation movement needs to prepare and promote a national environment curriculum for grades from kindergarten to year 12. There should be a strong emphasis in this curriculum on ecological principles and the place of humans in the world ecosystem. It is encouraging that a new emphasis has been placed on environmental education in at least the New South Wales school system.

Recent policies at state and commonwealth levels have done little to foster research or to stimulate education. Despite recent increases, funding for research is hopelessly inadequate as is the training of people to undertake the studies required to move resource management into the 21st century. There are no jobs, no incentives, no opportunities to encourage young people to undertake research or teaching careers in the environmental sciences as required for the development of endangered species management and conservation programmes. As mentioned previously, this issue is not addressed in Senator Richardson's draft strategy document on endangered species, yet it is basic to meeting the strategy's stated goals.

There are other problems in the field of research and science. **Australia's scientists are both silent and silenced.** Much needs to be done to guarantee the free exchange of scientific information and advice between Australia's scientific community and the general public. Too many scientists are prevented from public comment by government policies and others are stopped from commenting for fear of losing research funds or being denied permission to work on lands controlled by particular government departments (Recher, in prep.). As a result, the conservation movement is often forced to act

with incomplete information while government departments and developers control the flow of information; information which is usually funded by the Australian taxpayer.

Non-Government Organizations

The issues discussed above identify clear goals and responsibilities for groups and individuals outside government. For the immediate future non-government organizations (NGOs) must provide leadership in the areas of environmental management and sustainable development. Until governments develop a sense of environmental responsibility the NGOs will need to be educators, to show initiative, and to protest.

In the limited time remaining to Australia and the world to avert ecological and environmental collapse governments have been too slow to respond. Indeed, the entrenched bureaucracy has strongly resisted change. From this it is clear that government is poorly prepared to deal with environmental issues; government is cumbersome, lacks the necessary expertise and may too often lack the intellectual stamina required to deal with complex events. It will be up to non-government organizations to provide government with the ideas, information and timetables that government cannot provide for itself.

At a recent meeting of the Australian Institute of Biologists I concluded that "the future of ecology is in politics" (Recher 1989). I think much the same could be said for the future of the environment movement. There are long delays between the education of the young and their assumption of power. It is also difficult to teach the old new values. When these realities are put alongside the urgency of resolving environmental issues and preventing the massive extinction of species, then the only option is to place environmentally aware and ecologically informed persons in government. I do not endorse the view that the sole role of NGOs is to lobby government. Lobby by all means, but people who are informed and concerned about the state of the Australian environment and the future of its biota should consider politics as the quickest avenue to achieving change within government.

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Conserving What? — The basis for nature conservation reserves in New South Wales 1967-1989

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INTRODUCTION

With the establishment of the National Parks and Wildlife Service in New South Wales in 1967 a major programme commenced to establish a comprehensive reserve system for nature conservation as well as other purposes. As at 30 June, 1988 this system consisted of 68 National Parks, 185 Nature Reserves, 22 State Recreation Areas, 13 Historic Sites and nine Aboriginal Areas covering 3.7 million hectares or about 4.62% of the land area of New South Wales (NPWS 1988). Much of the conservation biology literature which examines the principles of reserve design (e.g., Soule and Wilcox 1980; Soule 1986; Simberloff 1986) focuses on the operational principles in designing reserve boundaries and size without canvassing the threshold question of exactly what is it that we seek to conserve in their establishment. All too often the absence of debate on the range of options and choices in defining the underlying philosophy of what we are seeking to conserve in nature reserves obscures the significant implications of the choices involved and makes subsequent consideration of the principles of reserve design complex and inconclusive. This paper seeks to raise debate on the underlying basis of nature reserve establishment programmes by examining the experience of the New South Wales National Parks and Wildlife Service from 1967 until 1989, by posing the range of options available as driving forces for a nature conservation programme and by highlighting the significantly different priorities which emerge from these options.

HISTORICAL PERSPECTIVE

The National Parks and Wildlife Service was established as an organization in November 1967. Its staff were an amalgam of the Parks and Reserves Branch of the Lands Department and the Fauna Protection Panel of the Chief Secretary's Department. The organization was modelled very much on the United States National Parks Service even to the extent that the first Director, Samuel P. Weems was imported from the United States Service (Pettigrew and Lyons 1979). Yet paradoxically although the external symbols of nomenclature, uniform and language are similar and the founding intent of Tom Lewis as Minister for Lands and founder of the Service was to replicate the United States Parks Service in New South Wales, the two organizations are more divergent than is readily appreciated.

Part of this divergence is a product of history. Both nations share an antiquity in national park establishment. Yellowstone, the world's first National Park was established in 1872 (Bartlett 1985). The Royal National Park on the southern outskirts of Sydney was the world's second national park established in 1879, although it did not gain its regal appellation until graced by Queen Elizabeth II in 1954, prior to which it was just "The National Park" (Pettigrew and Lyons 1979).

Park establishment proceeded apace in both nations with Ku-ring-gai Chase National Park on Sydney's north established in 1894 (Goldstein 1979). But as an organization the United States National Parks Service was